

REMARKS/ARGUMENTS

Claims 1-33 are pending in the application. These claims have all been rejected on various grounds as set forth in the Office Action. In response thereto, applicants have amended claims 1-6, 8, 10-13, 15, 18-20, 26, 28-31 and 33 and added new claims 34-42. Claims 2, 12 and 13 have been canceled without prejudice or disclaimer. The claim amendments and new claims are all supported by the application as filed and thus they raise no issue of new matter. Additionally, applicants have amended the specification of the application at pages 12 and 21-22 to correct an obvious typographical error therein. This correction also adds no new matter to the application. Further, applicants additionally amended the specification at page 27 in the description of Figure 5 to incorporate a description of identification no.54 in the subject figure. This description is supported by the as-filed application and thus raises no question of new matter. Entry of the amendments to the specification and claims is thus respectfully solicited, as well as the entry of new claims 34-42. Upon such entry, claims 1, 3-11, 14, and 16-42 will be pending in the application. In light of the amendments and Remarks provided herein, the Examiner is respectfully requested to reconsider and withdraw her objections and rejections so that the application may proceed to issuance.

Objections to the Drawings

The drawings are objected to because Figure 5 includes the reference no. "54" which allegedly does not appear in the specification.

In response to the objection, applicants have amended the specification on page 27, in the description of Figure 5, to describe reference no. 54 (i.e., as a matrix). Support for this amendment is found in claim 25 of the translated PCT priority document (PCT/EP00/01916), which claim was amended to remove its multiple dependency in the Preliminary Amendment forwarded September 6, 2001 with the present application. Claim 25 forms part of the application as originally filed and it supports the amendment to page 27.

The Examiner is therefore requested to reconsider and withdraw her objection to the drawings.

Objections to the Specification

The Office Action states (p.3) that on page 6, in the second paragraph, it is unclear to the Examiner how a bundle having a diameter of 0.1 to 2 mm can have a braid thickness of 0.02 to 0.4 mm where the endpoint diameter of 2 mm would be greater than the braid thickness endpoint of 0.4 mm.

In response, applicants note that on page 6, second paragraph to page 7, second paragraph of the specification preferred embodiments of the invention are described (i.e., bundles with a diameter of 0.1 to 2 mm and braid thicknesses of 0.02 to 0.4 mm. These are preferred ranges, i.e., the invention is clearly not limited to these specific ranges. It is of course not possible to use a bundle with a diameter of 2 mm to obtain a braid thickness of 0.4 mm. However, it is possible to obtain a braid with a thickness of 0.02 to 0.4 mm by braiding bundles with diameters of less than 0.2 mm, which dimension(s) are encompassed by the preferred range of the bundle diameter of 0.1 to 2 mm. The preferred braid thickness of 0.1 to 2 mm is also consistent in light of the disclosure on page 7, first and second paragraph, wherein the application teaches that in a further preferred embodiment the bundles consist of a number of carbon fibers, which can have a diameter of 7-20 μm .

The Office Action additionally states that on page 12, line 2, the word “hydrophobing” does not appear to be in the English language dictionary and it appears that the applicants mean “hydrophobic”. The Office Action further notes that the word “Hydrophobing” also appears on pages 21 and 22 of the specification.

In response, applicants have amended the specification at pages 12, 21 and 22 to change “hydrophobing” to “hydrophobic”. They submit that the term “hydrophobing” originally came from a translation of the German word “Hydrophobierungszusatz” in the priority application which literally translates to a “hydrophobing additive”. Such additives are compounds which can confer hydrophobic features and which therefore are themselves hydrophobic. Thus the amendment of “hydrophobing” to “hydrophobic” adds no new matter to the application.

In light of the explanations above, the Examiner is respectfully requested to reconsider and withdraw her objections to the specification.

Objection to the Oath/Declaration

The Office Action states (p.3) that the oath or declaration is defective because the second inventor, Norbert STROH did not provide the date on which he executed the oath.

In response, applicants submit herein a replacement Declaration and Power of Attorney which has been re-signed and also dated (July 5, 2004) by inventor Norbert STROH, together with a separate replacement Declaration and Power of Attorney which has been resigned and also dated (July 25, 2004) by co-inventor Thomas Hofler. These executed forms attest to the application as amended in the Preliminary Amendment filed September 6, 2001. Submission of these documents is believed to overcome the Examiner's objection to the original Oath of Mr STROH, which should therefore be withdrawn.

Further to the above, the Office is respectfully informed that co-inventor Dr. Hofler has changed his address since the filing of the application. His new address, which is reflected on the replacement Declaration and Power of Attorney submitted herein, is Thuillestrasse 65, 81247 Munchen, Germany. The Examiner is therefore requested to ensure that this change to the co-inventor's address is reflected in the record concerning this application.

Claim Interpretation

The Office Action states (pp.3-4) that the majority of the claims contain a broad limitation followed by a narrower limitation prefaced by the word "preferably". The Examiner states that, for all of the pending claims, the Examiner gives the claim the broadest reasonable interpretation in light of the specification and, "claims reciting embodiments prefaced by the word "preferably" is not given patentable weight in the claims." (Emphasis in original). The Examiner points to claims 20 and 29 as examples of this type of claiming.

In response, applicants have identified claims 5, 11, 12, 19, 20, 28 and 29 as containing the type of language described by the Examiner. These claims (except for claim 12, which is cancelled) have therefore been amended to delete therefrom the clauses in question. The scope of these claims has not changed since, as noted above, the Examiner did not attach any patentable weight to the indicated language. Furthermore, new claims 34-42 have been added to the application. These claims are directed to the features of the invention deleted from their parent claims. As all of the new claims

34-42 are supported by their original, parent claims, these new claims do not raise any issue of new matter. Entry of these new claims is thus respectfully requested.

Claim Objections

The Examiner, on pp. 4-5 of the Office Action has raised several objections to the claims, as follows:

Claim 6 is objected to because it includes the word “hydrophobing”. Applicants have therefore amended the subject claim to change “hydrophobing” to “hydrophobic”. The support for this change is discussed in the section above dealing with the Examiner’s objection to pp. 12 and 21-22 of the specification.

The Examiner additionally objects to claim 3. She states that in claim 3, the limitation, “the more than one metal wires (21) are in the form of a stranded conductor” does not limit claim 2 [i.e., the claim from which claim 3 depends] because it does not actually require claim 2 to have more than one metal wire in the lumen. Applicants have therefore amended claim 3 to recite a tubular composition as claimed in claim 2 “containing more than one metal wire in its lumen”, which phrase thus provides support for the further recitation in the subject claim that the more than one metal wires (21) are in the form of a stranded conductor. Support for the amendment to claim 3 is found in claim 2 which recites that the cavity or lumen of the tubular composite contains one or more metal wires.

Claim 10 is objected to. The Examiner stated that the limitation in the subject claim , “in which the spacer (13,15) is designed as a braid of electrically insulating or ion-conducting fibers” does not appear to further limit claim 8 which is drawn to “an ion conductive or neutral spacer” because a braid of electrically insulating fibers would not be an ion conductive spacer and a braid of ion conducting fibers would not be a neutral spacer. In response, applicants have amended claim 10 to change its dependency from claim 8 to claim 9 and to identify the spacer as spacer (15), i.e., of claim 9, rather than the spacer (13) of claim 8. Since, according to claim 9, further spacer (15) is covered by a further braid (17) of bundles and/or filaments or fibers of an electron-conducting material, it is understandable that spacer (15) [i.e., the “further” spacer of claim 9] may be designed as a braid of electrically insulating or ion-conducting fibers.

The Examiner objected to claim 18 due to the use of the trademark “NAFION®”. Applicants have therefore amended the subject claim to replace the trademark with the generic phrase “perfluorosulfonic acid polymer”, which amendment is supported by the application as filed.

The Office Action additionally states that in “claim 20”, the limitation, “containing at least on module” should be “containing at least one module”. Claim 20 does not include the indicated language and applicants believe that instead of claim 20, the Examiner meant to point to claim “26” which does contain the indicated language. The suggested change has therefore been made to claim 26.

In light of the amendments to the claims and the remarks presented above, the Examiner is respectfully requested to reconsider and withdraw her objections to the claims.

Rejections Under 35 U.S.C. §112, First Paragraph

Claims 1-33 are rejected under 35 U.S.C. §112, first paragraph as allegedly failing to comply with the written description requirement. The Office Action states (p.6) that in claim 1, the limitations “a braid (3) of bundles and/or filaments or fibers of an electron-conducting material” and “braiding of the bundles and/or filaments or fibers to form a hose” do not appear in the original disclosure. Instead, the original disclosure (see page 4 of the specification) states “a tubular braid of bundles and/or filaments of an electron conducting material”. The Office Action further states that present claim 1 is an amended claim during the international stage of prosecution and it appears that the limitations recited above are not in the original claims or specification. The Office Action additionally states that page 10 of the original specification also recites, “a braid of bundles and/or filaments of an electron-conducting material”. The Office Action also states that claims depending from claims rejected under 35 U.S.C., first paragraph, are also rejected for the same reason.

Further to the above, claims 1-33 are rejected under 35 U.S.C. §112, first paragraph, as allegedly being non-enabling. The Office Action states (p.6) that the specification, while being enabling for a braid of bundles of carbon fibers and/or metal wires of an electron conducting material, does not reasonably provide enablement for all electron conducting materials. The Office Action further states that the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope

with these claims. The Office Action goes on to state (pp. 6-7) that the specification only discloses carbon fibers and metal wires as the only electron-conducting materials that can be braided. The Office Action states that it would [require] undue experimentation by one of ordinary skill in the art to determine what other electron-conducting material can be braided that would be encompassed by applicants' claimed invention.

In response to the "written description" and "enablement" rejections of applicants' claims, applicants have amended claim 1, i.e., the only independent claim in the application, as indicated above. The amended claim is believed to be written in a manner which overcomes both grounds of rejection under paragraph 1 of §112. That the braid can consist of bundles of carbon fibers is clear from page 7, first paragraph. That individual bundles of carbon fibers can be replaced by metal wires, or metal-wire bundles is also disclosed in the first paragraph of page 7, That the braid may comprise bundles of metal wires is disclosed on page 7 in ¶4. That the tubular composite is designed as a tube or hose and defines a cavity is clear from the disclosure at page 4, last paragraph. Finally, that the lumen contains at least one metal wire is disclosed in original claim 2, as well as in the paragraph bridging pp 7-8 of the specification. As demonstrated above, therefore, the invention as now recited in amended claim 1 is completely supported by the written description contained in the specification. In addition, the practice of the invention as now claimed would require no "undue experimentation" by one skilled in this art. Thus applicants' claims meet the enablement requirement, as well as the written description requirement, of 35 U.S.C. §112. The Examiner is therefore respectfully requested to reconsider and withdraw the rejections of applicants' claims under §112, ¶1.

Further to the above, claim 30 is separately rejected under paragraph 1 of §112. The Office Action (p.7) states that the specification, while being enabling for polyvinyl alcohol as a material which can easily be washed out, does not reasonably provide enablement for all materials which can be easily washed out. The Office Action further states that it would take undue experimentation by one of ordinary skill in this art to determine what other materials can be easily washed out that would be encompassed by applicants' claimed invention. Applicants respectfully traverse the Examiner's rejection as one of ordinary skill in this art would readily be familiar with a variety of additional materials, other than PVA (polyvinyl alcohol), which could easily be washed out of a composite such as is that which is the subject of claim 30. Applicants are not, therefore, required to teach in their

specification that which is already known in the art. That is, PVA was provided as a sole example precisely because applicants are aware that a skilled artisan would immediately comprehend which materials could be used, and would not require a detailed teaching in that regard. Nevertheless, in order to expedite the prosecution of this application, applicants have herein amended claim 30 to delete the phrase “an intermediate layer of a material which can easily be washed out” and replace it with the phrase “a temporary intermediate layer which serves as a base for application of an ion-conducting layer” which is supported by the teachings at p. 23, lines 22-26. Applicants contend, as indicated above, that one of ordinary skill in this art, upon review of applicants’ disclosure, would readily recognize those materials which fit the indicated language, and would not require any undue experimentation in so doing. For the reasons above, the Examiner is respectfully requested to reconsider and withdraw the rejection of claim 30 under §112, ¶1.

Rejections Under 35 U.S.C. §112, Second Paragraph

Claims 1-33 are rejected under the second paragraph of 35 U.S.C. §112 for alleged indefiniteness. The Office Action states (p.7) that, in general, all the claims are replete with problems of indefiniteness and it is unclear to the Examiner what applicants are intending to claim as their invention.

In particular, the Examiner noted (p.8) that, in claim 1, the limitation “a braid (3) of bundles and/or filaments or fibers of an electron-conducting material” is indefinite because it is unclear what the bundles are. The Examiner additionally stated that, also in claim 1, the limitation “braiding of the bundles and/or filaments or fibers to form a hose comprising a braid of this electron-conducting material” is also indefinite. In response, applicants submit that the amendments to claim 1, in which the above-described objected-to language has been deleted from the claim, renders claim 1 sufficiently definite to fulfill the requirements of 35 U.S.C. §112, ¶2.

The Office Action additionally states that in claims 1 and 29, the limitation, “and, if appropriate” is indefinite because it is unclear under what conditions it is appropriate for drying. In response, applicants note that claims 1 and 29 have been amended to delete the language objected to by the Examiner as indefinite. As such, the Examiner is therefore requested to reconsider and withdraw the rejection of these claims.

The Office Action further states (p.8) that in claims 1-33 it is unclear what makes up the bundles. In response, applicants submit that, as amended, independent claim 1 now more clearly recites what these bundles are comprised of.

The Office Action additionally states that in claims 4 and 5 the limitation “in each case” is indefinite because it is unclear what case this limitation is referring to. In response, claims 4 and 5 have been amended to delete the subject language from the claim. This amendment is believed to overcome the Examiner’s objections to these claims.

The Office Action also states, with regard to claim 5, that the limitation, “if appropriate together with charcoal, soot or graphite” is indefinite because it is unclear under what conditions it would be appropriate. Claim 5 has therefore been amended to delete the subject language (which is now the subject of new claim 34). The Examiner also states that the limitation, “subgroup VIII of the periodic system of the elements” is unclear and it appears that “subgroup VIII of the periodic table of elements” is meant. Applicants have therefore further amended claim 5 to change “periodic system” to “periodic table”. Claim 5, as amended, is therefore believed to overcome the Examiner’s grounds for objection thereto.

The Office Action goes on to state that in claim 8 the limitation “neutral spacer” is indefinite because it is unclear what neutral means. The Examiner states that the specification teaches that the word “neutral” means electrically insulating. Applicants have therefore amended claim 8 to change “neutral spacer” to “electrically insulating spacer”. This amendment is believed to overcome the Examiner’s objection to the claim.

The Office Action states that in claim 10 the limitation , “the spacer (13,15) is indefinite because it is unclear which spacer the claim is referring to since claim 8 from which it [claim 10] depends recites an ion-conductive or neutral spacer. Claim 10 has now been amended to depend from claim 9, rather than claim 8. Claim 9 recites the addition of a “further spacer (15) “. Thus, in addition to adjusting its dependency, claim 10 has been further amended to refer to “the further spacer (15)”. These amendments are believed to overcome the Examiner’s objection to the claim.

The Office Action next states that the limitation, “the electron-conducting material is an electron-conducting woven support, in particular an electrode” is unclear. Claim 11 has therefore

been amended to delete the phrase, “in particular an electrode” which has been made the subject of new claim 35.

The Office Action states that in claim 13 the limitation, “substantially comprise metal” is indefinite because it is unclear what amount “substantially” encompasses and one of ordinary skill in the art would not know what is meant by “substantially comprise metal”. In response, claim 13 has been canceled without prejudice or disclaimer, thus rendering moot the rejection of this claim..

The Office Action next states that claim 14 recites the limitation, “the metal” in line 1 and that there is insufficient antecedent basis for this limitation in the claim. The subject claim depends from claim 1. Thus, “the metal” recited in claim 14 relates back to the metal described in claim 1. Claim 1 recites a braid (3) of an electron-conducting material wherein the braid may comprise, *inter alia*, metal wires. Thus, “the metal” as recited in claim 14 refers to the metal used in forming the metal wires recited in claim 1. Applicants respectfully submit that there is clearly a sufficient antecedent basis for “the metal” in claim 14.

The Office Action states that there is insufficient antecedent basis for the limitation “the carbon fibers” in line 1 of claim 15. Claim 1, from which claim 15 depends, now as amended specifically recites bundles of “carbon fibers” in subparagraphs (a)-(d). This recitation provides clear antecedent support for the recitation of “the carbon fibers” in claim 15.

Claim 18 is rejected due to the recitation of “other” anionic polyaryl ethers and “other” sulfonated perfluorinated polymers. The Office Action states that the use of the word “other” renders the claim indefinite. In response, applicants have amended claim 18 to delete “other”, which is believed to overcome the grounds for rejection of the subject claim.

As regards claim 22, the Examiner objects to the limitation, “in which the braid (11,17) which faces the surface of the tubular composite (1)” because the tubular composite would have an inner surface and an outer surface. Applicants have therefore amended the subject claim to refer to the “outer” surface. It is thus the braid which faces the outer surface which is in electrically conductive contact with outer connection (31). The amendment is thus believed to overcome the rejection of the claim.

In claim 28, the Examiner has objected to the language, “in particular as claimed in claim 1”. The Office Action states that it is unclear whether claim 28 is required to depend from claim 1.

Applicants have therefore amended claim 28 to delete the phrase, “in particular”. This amendment is deemed to overcome the rejection of the claim.

In claim 29, the Examiner objected to the phrase, “in each case”, stating that the phrase is indefinite since it is unclear what case is being referred to. Applicants have therefore amended the subject claim to delete the phrase “in each case” therefrom. This amendment is believed to overcome the rejection of the claim.

In claim 30, the Examiner objects to the phrase, “followed by an intermediate layer of a material which can easily be washed out”. Applicants have thus amended the subject claim to replace the phrase with the language, “a temporary intermediate layer which serves as a base for application of an ion-conducting layer”, which amendment is supported by the disclosure in the last paragraph on page 23 of applicants’ specification. The objection should therefore be withdrawn.

The Office Action additionally states that in claim 33, the limitation, “the intermediate layer made from a material which can be easily washed out” is indefinite. Applicants have amended claim 33 such that it now depends from claim 30 (instead of claim 28). Claim 30 has been amended as described above and provides an antecedent basis such that claim 33 as amended refers to, “the temporary intermediate layer.” The objection to claim 33 should thus also be withdrawn.

The Office Action additionally states (p.11) that there is insufficient antecedent basis for the phrase “the intermediate layer” in claims 31 and 33. Both of these claims have been amended such that they now depend from claim 30. Claim 30 provides a proper antecedent basis for the recitation of “the temporary intermediate layer” in claims 31 and 33. The rejection of claims 31 and 33 should thus be withdrawn.

Furthermore, the Office Action states that claim 33 recites the limitation, “the individual hollow fibers” in line 3, and there is insufficient antecedent basis for this limitation in the claim. Claim 33 has therefore been amended to delete the word “the” and thus now recites simply “individual hollow fibers” for which no antecedent basis is required.

In view of the amendments to the claims and the remarks presented above, the Examiner is respectfully requested to reconsider and withdraw the rejection of applicants’ claims under paragraph 2 of 35 U.S.C. §112.

Claim Rejections Under 35 U.S.C. §102

A) Claims 1-11,13,14 and 17-29 are rejected under §102(b) over U.S.P. 5,458,989

The Office Action states (p.11-14) that, as best understood, applicants' claims 1-11, 13, 14 and 17-19 are rejected under §102(b) over U.S.P. 5,458,989 to Dodge ("Dodge"). This rejection is respectfully traversed for the reasons which follow.

The Dodge patent describes a fuel cell assembly comprising a hollow member having a construction effective for passing a hydrogen-containing gas from its interior to its peripheral surface. The hollow member defines the interior space. Around the hollow member a first winding (i.e., an anode) is arranged. Around this first winding there is arranged an electrolyte material and around the electrolyte material there is arranged a second winding (i.e., a cathode). The reference describes (col. 34, lines 17-20) that the windings shown in Figures 33(a) - 33(f) may have a braided structure wherein the braid may be formed of expanded metal. In Figure 13 of the reference, there is shown an assembly in which the fuel cell is defined in the shape of a cylinder. The cylinder casing is formed by an inwardly located tubular anode and an outwardly located tubular cathode, between which an electrolyte layer is arranged. The reference additionally teaches (col. 36, lines 38-41) that the tubular electrodes can contain carbon fibers. In summary, therefore, the Dodge reference discloses a fuel cell having two electrodes, both of which may be in the form of a braid.

In contrast, the present invention is directed to a tubular composite (e.g., a fuel cell) which is formed with only a single braid defining an interior space having metal wires arranged therein. In addition, the composite of the present invention is further distinguishable from the tubular fuel cell described in Dodge in that Dodge contains no teaching or suggestion that his braids may be formed from bundles of carbon fibers, bundles of metal wires or bundles of carbon fibers plus metal wires, such as is taught for use in the present invention and as recited in applicants' claim 1, i.e., the only independent claim. Applicants' invention as recited in claim 1 is thus not anticipated by the patent to Dodge. Moreover, claims 3-11,14 and 17-29 (claims 2 and 13 have been canceled) all depend directly or indirectly on claim 1 and thus contain all of the recitations of that claim. Therefore, those claims are also not anticipated by Dodge for the same reasons as claim 1. The Examiner is therefore respectfully requested to reconsider and withdraw the anticipation rejection based on the patent to Dodge.

B) Claims 1-14 and 16-29 are rejected under §102(b) over WO 97/47052

The Office Action states (p.14) that claims 1-14 and 16-29 are rejected under 35 U.S.C. §102(b) over WO 97/47052 of the Southwest Research Institute (“SRI”). This rejection is respectfully traversed for the reasons which follow.

The SRI reference describes a cylindrical fuel cell and methods for manufacturing the same. The fuel cell described in the reference comprises an anode, an electrolyte membrane and a cathode. The individual parts of the fuel cells described in SRI are always designed in the form of a layer (see Fig. 2). Moreover, it is abundantly clear from the methods used to form the fuel cell of the reference, i.e., solution casting, rolled sheet construction and sputtering, that the individual components are formed as layers. The SRI reference does not, however disclose or even suggest a tubular composite formed of a braid defining an inner space having metal wires arranged therein, as recited, for example, in applicants’ claim 1. Claim 1 is thus not anticipated by the SRI reference. Moreover, as claims 2-14 and 16-29 depend directly or indirectly from claim 1 and thus contain all of the recitations of that claim, these claims are also not anticipated by the SRI reference for the same reasons as claim 1. Applicants therefore respectfully request that the Examiner reconsider and withdraw the anticipation rejection of claims 1, 3-11, 14 (claims 2, 12 and 13 have been canceled) and 16-29 over the SRI reference.

C) Claims 1-14 and 16-29 are rejected under §102(b) over WO 98/16963

Claims 1-14 and 16-29 are rejected (p.15) under 35 U.S.C. §102(b) over WO 98/16963 of W.L.Gore and Associates, Inc. (“Gore”). This rejection is respectfully traversed for the reasons which follow.

The Gore reference discloses a fuel cell assembly including a porous tubular substrate or carrier and a plurality of elongated flexible polymer electrolyte fuel cells wound in side-by-side relation onto the substrate or carrier. Each elongated cell includes a central proton exchange membrane, a cathode element mounted on one side of the membrane, and an anode element mounted on the other side of the membrane. As shown in Figure 3 of the reference, each of the electrodes is designed as a layer. Further, according to claim 2 of Gore, both the cathode and the anode elements

are formed of a catalyst containing a carbon sheet. In summary, therefore, the single cells of the fuel cell described in the Gore reference are formed of layers. These single cells are wound on a tubular carrier. In contrast to the disclosure of the reference, the present invention is directed to a tubular composite formed of a braid defining an inner space having metal wires arranged therein. As this construction is neither taught nor even suggested by the Gore reference, applicants submit that claim 1 of their application is distinguishable thereover. Moreover since, as noted above, claims 3-11, 14 (claims 2, 12 and 13 are canceled) and 16-29 each depend, directly or indirectly on claim 1, they all contain the recitations of that claim. The subject dependent claims are therefore distinguishable over Gore for the same reasons as claim 1.

D) Claims 1 and 5 are rejected under §102(b) over the EPO English Abstract
For DE19539257

Claims 1 and 5 are rejected (p.15) under §102(b) over the EPO English language abstract of DE 19539257 of Daimler Benz Aerospace AG ("Daimler"). This rejection is respectfully traversed for the reasons which follow:

The Daimler reference describes an assembly whose surface form is changeable. The assembly comprises a housing in which a foam of a polyurethane resin is arranged. One or more pressure chambers are located within the foam. Electrochemical cells are embedded within the pressure chambers. These cells can generate gas and thus enlarge the pressure chambers. According to Figure 2 of the reference, each electrochemical cell is formed with an outer cover made of braided carbon fibers which are covered with platinum as a catalyst. The cavity formed by the outer cover is filled with a gel of potassium hydroxide which serves as an electrolyte. Braided silver wires are embedded within the gel. Daimler therefore discloses a construct wherein the cavity formed by the braid of carbon fibers is filled with an electrolyte into which silver wires are embedded. Thus, in Daimler the electrolyte is arranged on the inner side of the braid of the carbon fibers. In contrast, in the present invention the electrolyte is arranged on the outer side of the braid. Moreover, the present invention is even further distinguishable from the cited reference in that in that the braid used in forming the Daimler construct is not formed of bundles of carbon fibers or bundles of metal wires,

or bundles of carbon fibers plus metal wires, as is the tubular composite presently recited in applicants' claim 1. Therefore, claim 1 is distinguishable over Daimler, as is claim 5 which depends (indirectly) therefrom and which thus contains all of the recitations of the subject claim. The Examiner is thus respectfully requested to reconsider and withdraw the rejection of claims 1 and 5 over the Daimler reference.

For all of the reasons presented above, therefore applicants respectfully request the Examiner to withdraw all of her anticipation rejections under 35 U.S.C. §102(b).

Claim Rejections Under 35 U.S.C. §103

Claims 1-12 and 17-29 are rejected (pp. 15-18) under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Dodge (U.S.P. 5,458,989). This rejection is respectfully traversed for the reasons set forth below.

The Dodge '989 patent is discussed in detail above in the portion of this Amendment dealing with the rejection of claims 1-11, 13, 14 and 17-29 as being allegedly anticipated by the subject patent. The comments and arguments set forth above are therefore specifically incorporated herein by reference thereto.

Further to those comments, however, applicants submit the following. In setting forth the grounds in support of her rejection, the Examiner in particular refers to Figure 13 of the reference which provides an illustration of a tubular fuel cell in cylindrical form. The side wall of the tube is comprised of an anode arranged on the inside and a cathode arranged on the outside. Between the anode and the cathode, an electrolytic member is located (see col. 10, lines 43-55). As discussed at col. 13, lines 14-18 of the patent, both electrodes can be formed of graphite or carbon fiber and can be supported, if necessary, on a suitable porous matrix material. According to the disclosure at col. 36, lines 38-41, the concentric tubular members can comprise carbon fibers derived, for example, from woven carbon cloth which confers an exceptional tensile strength and conductivity.

Dodge describes a cylindrical fuel cell comprising at least two windings, or two graphite membranes or two carbon cloths or two braids of carbon fibers, respectively. In contrast, in the present invention, only one electrode is in the form of a self-supporting braid, whereas the other electrode is arranged within the interior space of the braid in the form of a wire. There is no

disclosure in Dodge which would suggest to one of ordinary skill in this art the use of the arrangement recited, e.g., in applicants' claim 1.

Furthermore, the Dodge patent additionally does not teach, or even suggest, that the braid, as in the case of applicants' invention, may be comprised of bundles of carbon fibers which may optionally be replaced by metal wires or bundles of metal wires. The reference additionally contains no description to the effect that one or more wires may be arranged in the interior space defined by the braid, as in applicants' invention. Due to the above-described differences in its construction, the presently claimed tubular composite has the following advantages over the apparatus described by Dodge:

(A) In contrast to the assembly of the Dodge patent, applicants' assembly comprises only one self-supporting braid, not two braids or windings as used in Dodge. Due to this difference, production of the presently claimed tubular composite requires much less material than the apparatus described in the reference, thus reducing cost of the item and increasing the efficiency of producing it. Moreover, the weight of applicants' tubular composite is substantially reduced in contrast to the device of Dodge, which is an important consideration in the fuel cell art; and

(B) Due to the simpler structure of applicants' invention, the presently claimed tubular composite may be used as an ion-exchange membrane. Presently, the only ion-exchange membranes known in the art are in the form of plates. This requires that a device be compartmentalized wherein each compartment requires its own dedicated ducts for supply and discharge. Through the use of the present invention this need for compartmentalization is obviated and the resultant device is much simpler and easier to construct and operate.

For the reasons above, therefore, applicants' invention as recited, e.g., in claim 1, is not obvious to one of ordinary skill in the art over the disclosure of Dodge. Furthermore, as claims 3-11 (claims 2 and 12 are canceled) and 17-29 depend directly or indirectly from claim 1, and thus contain all of the recitations of the subject claim, these claims are also distinguishable over the cited reference.

Summary

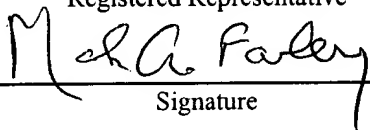
Claims 1, 3-11, 14-33 and new claims 34-42 are believed to distinguish the invention over all of the references cited by the Examiner. The Examiner is therefore requested to reconsider and withdraw her objections and rejections of the application so that the application may proceed to issuance.

If the Examiner believes that a telephone discussion would advance the prosecution of this application, she is respectfully invited to telephone applicants' representative at the number below.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on August 12, 2004:

Mark A. Farley

Name of applicant, assignee or
Registered Representative

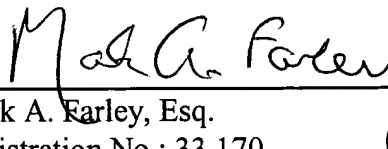


Signature

August 12, 2004

Date of Signature

Respectfully submitted,



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